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Case No.: 59626US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: MERRY, RICHARD P.  
Application No.: 10/824029 Confirmation No.: 6037  
Filed: April 14, 2004 Group Art Unit 1797  
Title: SANDWICH HYBRID MOUNTING MAT

**BRIEF ON APPEAL**

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<i>July 8, 2008</i> Date	<i>Kathleen M. Murray</i> Signed by: Kathleen M. Murray

Dear Sir:

This is an appeal from the final Office Action mailed on January 10, 2008 finally rejecting claims 30, 32-42, and 44-49.

A Notice of Appeal in this application was mailed on April 10, 2008, and was received in the USPTO on April 10, 2008. The request for a one month extension of time for filing this Appeal Brief is included with this paper.

Appellants request the opportunity for a personal appearance before the Board of Appeals to argue the issues of this appeal. The fee for the personal appearance will be timely paid upon receipt of the Examiner's Answer.

**Fees**

- ☒ Any required fee under 37 CFR § 41.20(b)(2) will be made at the time of submission via EFS-Web. In the event fees are not or cannot be paid at the time of EFS-Web submission, please charge any fees under 37 CFR § 1.17 which may be required to Deposit Account No. 13-3723.
- ☒ Please charge any additional fees associated with the prosecution of this application to Deposit Account No. 13-3723. This authorization includes the fee for any necessary extension of time under 37 CFR § 1.136(a). To the extent any such extension should become necessary, it is hereby requested.
- ☒ Please credit any overpayment to the same deposit account.

Request for Extension of Time

Under the provisions of 37 CFR § 1.136(a), Applicant(s) petitions to extend the period for filing a reply in the above-identified application as follows: (check time period desired):

- ☒ 37 CFR § 1.17(a)(1) - Extension within first month.
- ☐ 37 CFR § 1.17(a)(2) - Extension within second month.
- ☐ 37 CFR § 1.17(a)(3) - Extension within third month.

Fees Associated with Extension

Payment of the fee for any requested extension is authorized in the above fee section.

**REAL PARTY IN INTEREST**

The real party in interest is 3M Company (formerly known as Minnesota Mining and Manufacturing Company) of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

**RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related appeals or interferences.

**STATUS OF CLAIMS**

Claims 30, 32-42 and 44-49 are pending, stand rejected and are being appealed. Claims 1-29, 31 and 43 were cancelled. Claims 50 and 52-58 are withdrawn.

**STATUS OF AMENDMENTS**

No amendments have been filed after the final rejection.

**SUMMARY OF CLAIMED SUBJECT MATTER**

The claims at issue concern a multilayer mat (see e.g., Figs. 1-6) and a pollution control device (see e.g., Figs. 7 and 8) that comprises an outer housing, a pollution control element and the multilayer mat positioned between the outer housing and the pollution control element. The multilayer mat comprises an intumescent layer sandwiched between a first non-intumescent layer and a second non-intumescent layer. By sandwiching the intumescent layer between the non-intumescent layers, the intumescent material in the intumescent layer is protected from excessively high temperatures coming from inside the pollution control element (e.g., hot exhaust gases) by the non-intumescent layer between the pollution control element and the intumescent layer. At the same time, the intumescent material is insulated from the relatively cold temperatures outside of the pollution control device by the non-intumescent layer between the pollution control device housing and the intumescent layer. If the intumescent material gets too hot, the expansion characteristics of the intumescent material can be detrimentally altered, but if the intumescent material doesn't get hot enough to cause enough expansion of the intumescent

material, the multilayer mat will not mount the pollution control element within the housing properly. By sandwiching the intumescent layer between the two non-intumescent layers, the intumescent layer can avoid being heated to too high of a temperature and not heating to a sufficiently high temperature.

In addition, the intumescent layer is positioned entirely within the area of the first non-intumescent layer and the area of the second non-intumescent layer, with at least one of the outer edges of the mat being free of intumescent material. In many pollution control devices, the incoming gas stream can impinge upon an exposed edge of the mounting mat. If the mounting mat contains intumescent material near its exposed edge, the gas stream can erode intumescent material out of the mat and become lodged in the pollution control element. Such lodged intumescent material can, for example, reduce the flow of gas through the pollution control element and detrimentally increase system back pressure. By being positioned entirely within the area of the non-intumescent layers such that at least one outer edge of the mat is free of intumescent material from the intumescent layer, such detrimental erosion of the intumescent material can be avoided.

(Pages and Lines Relate to the Specification, as Filed, Unless Otherwise Stated)

### **CLAIM 30**

Independent claim 30, and claims 32-40 dependent thereon, concern a multilayer mat (see e.g., Ref. Nos. 30, 50, 100, 150, 155, 160, 165, 170, 180, 192 and 200; Figs. 1-8; page 5, line 25 to page 6, line 11; page 6, line 23 to page 11, line 12; and page 35, lines 11-29) comprising an intumescent layer (see e.g., page 6, lines 12-18; Ref. Nos. 120 and 193; Figs. 1-6; and page 5, line 28 to page 10, line 17) sandwiched between first and second non-intumescent layers (see e.g., page 6, lines 19-22; Ref. Nos. 110 and 130; Figs. 1-6; and page 5, line 28 to page 10, line 17). The intumescent layer has opposite outer edges (see e.g., Figs. 1-6), opposite ends (see e.g., Ref. Nos. 151, 156, 158, 171, 173 and 188; and Figs. 1, 2, 5 and 6), a first major surface, a second major surface opposite the first major surface, and an area A1 (see e.g., Figs. 1, 3C, 4A and 4B; page 4, lines 16-22; page 7, lines 2-4 and 21-23; page 7, line 31 to page 8, line 3; page 27, lines 21-30; and page 33, line 27 to page 34, line 4). Each of the first non-intumescent layer and second non-intumescent layer has opposite outer edges (see e.g., Ref. Nos. 152, 154, 157,

159, 167, 169, 172 and 174; Figs. 2A, 2B, 3B and 5; page 7, lines 5-19; page 8, lines 10-16; page 10, lines 23-25; page 11, lines 1-4; page 37, lines 9-23; and page 41, lines 7-10) and opposite ends (see e.g., Ref. Nos. 151, 153, 156, 158, 166, 168, 171, 173, 188, 189 and 194, Figs. 2A, 2B, 3B, 3C, 5 and 6; and page 10, line 22 to page 11, line 12). Each of the non-intumescent layers comprises inorganic fibers (see e.g., page 11, lines 16-21). The First non-intumescent layer has an area A2 that is greater than area A1, and faces the first major surface of the intumescent layer, and the second non-intumescent layer has an area A3 that is greater than area A1, and faces the second major surface of the intumescent layer (see e.g., Figs. 1-6; and page 4, lines 20-31; page 6, line 31 to page 7, line 4, page 7, lines 21-23; page 8, lines 1-5; page 10, lines 1-5; page 27, line 25 to page 26, line 4; and page 34, lines 1-8). The intumescent layer is positioned entirely within the area A2 of the first non-intumescent layer and the area A3 of the second non-intumescent layer (see e.g., Figs. 1-6). At least one of the outer edges of the mat is free of intumescent material (see e.g., Figs. 1-6).

#### **CLAIM 41**

Independent claim 41, and claims 42 and 44-49 dependent thereon, concern a pollution control device (see e.g., Ref. Nos. 10 and 40, Figs. 7 and 8; and page 34, line 15 to page 37, line 24) comprising an outer housing (see e.g., Ref. Nos. 11 and 44, page 34, lines 15-23, and page 35, lines 9-29), a pollution control element (see e.g., Ref. Nos. 20 and 42, page 34, lines 15-23, and page 35, lines 9-29), and a multilayer mounting mat according to claim 30. The mounting mat is positioned between the pollution control element and the outer housing (see e.g., Figs. 7 and 8).

#### **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

##### **First Ground of Rejection**

Claims 30, 32-34, 37-42, 44-46 and 49 stand rejected under 35 USC § 102(e) as being anticipated by Maus (US Patent No. 7,179,429).

**Second Ground of Rejection**

Claims 35 and 47-48 stand rejected under 35 USC § 103(a) as being unpatentable over Maus (US Patent No. 7,179,429 B1) in view of Wirth et al. (WO 99/39086 - using US Patent No. 6,967,006 B1 as the US equivalent document).

**Third Ground of Rejection**

Claim 36 is rejected under 35 USC § 103(a) as being unpatentable over Maus (US Patent No. 7,179,429 B1) in view of Dinwoodie (US 2002/0025750 A1).

**ARGUMENT****First Ground of Rejection**

Claims 30, 32-34, 37-42, 44-46 and 49 stand rejected under 35 USC § 102(e) as being anticipated by Maus (US Patent No. 7,179,429).

Applicants assert that this rejection of claims 30, 32-34, 37-42, 44-46 and 49 under 35 USC § 102(e), should be reversed. In rejecting these claims, the Examiner improperly characterizes the Maus reference as disclosing all of the elements recited in these claims. In particular, for example, the Examiner states that Maus discloses an intumescent layer sandwiched between a first non-intumescent layer and a second non-intumescent layer, where the intumescent layer has opposite first and second major surfaces, the first non-intumescent layer faces the first major surface of the intumescent layer, and the second non-intumescent layer faces the second major surface of the intumescent layer.

Maus actually discloses an intumescent layer 5 and a non-intumescent layer 6, with a major surface of layer 5 facing a major surface of layer 6, and opposite edges of the non-intumescent layer 6 being folded inward (see reference no. 7 in Figs. 1 and 2) so that each edge of the non-intumescent layer 6 faces and contacts a corresponding opposite edge of the intumescent layer 5. Therefore, Maus only discloses a first non-intumescent layer 6 facing a first major surface of the intumescent layer 5. Accordingly, Maus does not disclose the limitation of “a second non-intumescent layer facing the second major surface of said intumescent layer”, and Maus does not disclose the limitation that “said intumescent layer is sandwiched between said first and second non-intumescent layers”.

Based on his citation to column 5, lines 27-31 in Maus, it appears the Examiner is taking the position that the opposite edge surfaces of the intumescent layer 5 are the major surfaces of the layer 5 and that, because the intumescent layer 5 is disposed between the opposite edges of the non-intumescent layer 6, there is a first and second non-intumescent layer respectively facing a first and second major surface of the intumescent layer 5, and the intumescent layer 5 is “sandwiched” between two non-intumescent layers. However, such a strained interpretation by the Examiner fails to take into consideration the normal use of the term “major surface”, and the Examiner provides no explanation for why a person of ordinary skill in the art would consider the surface formed by any edge of the Maus layer 5 to constitute a “major surface”. Even if such a strained interpretation is accepted, however, there are still other elements recited in claim 30 that are also not disclosed in Maus.

Claim 30 expressly recites that each of the area A2 of the first non-intumescent layer and the area A3 of the second non-intumescent layer is larger than the area A1 of the intumescent layer. Even if the Examiner’s apparent interpretation is accepted (i.e., that its opposite edges form the major surfaces of the Maus intumescent layer 5), Maus does not disclose this limitation of areas A2 and A3 each being larger than area A1, because each of the opposite edges of the non-intumescent layer 6 and each of the corresponding opposite edges of the intumescent layer 5, which face one another, have equal areas (see the edges that contact between layers 5 and 6 in Figs. 1 and 2).

In addition, going back to Applicant’s above noted position that the surface of its edge does not constitute a major surface of the Maus intumescent layer 5, the present application expressly defines the term “area” on page 5, lines 12-18 as follows:

As used herein, the term “area” refers to the area of a layer or mat calculated from the outer dimensions of a layer or mat (i.e., for a rectangular mat, the area is equal to the length multiplied by the width). Thus, a layer or mat that includes a trough can have an area that is substantially equal to that of a layer or mat free of a trough if the outer dimensions are substantially equal.

As used herein, the term “trough” refers to a layer or mat with a non-flat surface in which a portion of the surface is depressed compared to adjoining portions of the surface.

It is submitted that this express definition makes it particularly clear that the area recited in claim 30 is not the area of an edge of a layer.

Therefore, Maus does not disclose, teach or suggest each and every feature recited in the claims and, as such, Maus cannot anticipate claim 30 and the claims dependent thereon. Accordingly, it is submitted that the Examiner has failed to meet the USPTO's burden of proving a prima facie case of anticipation and, as a result, this rejection of claims 30, 32-34, 37-42, 44-46 and 49 under 35 USC § 102(e) should be overturned and the claims allowed.

It is also submitted that there are other limitations recited in these rejected claims, in addition to those discussed above, that also distinguish the claimed invention patentably from the cited art and the other art of record. These additional distinguishing limitations were not discussed, because there is no need to do so at this time.

### **Second Ground of Rejection**

Claims 35 and 47-48 stand rejected under 35 USC § 103(a) as being unpatentable over Maus (US Patent No. 7,179,429 B1) in view of Wirth et al. (WO 99/39086 - using US Patent No. 6,967,006 B1 as the US equivalent document).

Applicants assert that this rejection of claims 35 and 47-48 under 35 USC § 103(a), should be reversed. In rejecting these claims, the Examiner erroneously presumes that Maus discloses the invention of claims 31 and 43. As indicated above, Maus does not disclose, teach or suggest each and every feature recited in claim 30 or in the claims dependent thereon, including claims 31 and 43, and the recitation of Wirth et al. does not cure this defect in the rejection. Therefore, the inventions of claims 35 and 47-48 cannot result from the combined disclosures of Maus and Wirth et al. Accordingly, it is submitted that the Examiner has failed to meet the USPTO's burden of proving a prima facie case of obviousness and, as a result, this rejection of claims 35 and 47-48 under 35 USC § 103(a) should be overturned and the claims allowed.

It is also submitted that there are other limitations recited in these rejected claims, in addition to those discussed above, that also distinguish the claimed invention patentably from the cited art and the other art of record. These additional distinguishing limitations were not discussed, because there is no need to do so at this time.



**Third Ground of Rejection**

Claim 36 is rejected under 35 USC § 103(a) as being unpatentable over Maus (US Patent No. 7,179,429 B1) in view of Dinwoodie (US 2002/0025750 A1).

Applicants assert that this rejection of claim 36 under 35 USC § 103(a), should be reversed. In rejecting claim 36, the Examiner erroneously presumes that Maus discloses the invention of claim 36 except for the intumescent layer having “a thickness that is 5 to 25 percent of a total mat thickness”. As indicated above, Maus does not disclose, teach or suggest each and every feature recited in claim 30 or in the claims dependent thereon, including claims 36, and the recitation of Dinwoodie does not cure this defect in the rejection. Therefore, the invention of claim 36 cannot result from the combined disclosures of Maus and Dinwoodie.

In addition, Dinwoodie discloses a mounting mat having a single intumescent layer bonded to a single non-intumescent layer and paragraph [0040] in Dinwoodie discloses that the thickness of the intumescent layer is from “10 to 50% of the total thickness” of the double layer mat. In contrast, claim 36 recites a mat having at least an intumescent layer and two non-intumescent layers, with the intumescent layer having “a thickness that is 5 to 25 percent of a total mat thickness.” In rejecting claim 36, the Examiner states that it would have been obvious to the person of ordinary skill in the art “to make the multilayer mat with the claimed thickness, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.” The Examiner provides no explanation, however, for why Maus or Dinwoodie would motivate the person of ordinary skill in the art to make a mat having an intumescent layer sandwiched between two non-intumescent layers, and to keep the thickness of the intumescent layer in the range of from “5 to 25 percent” of the total thickness of the mat.

Accordingly, it is submitted that the Examiner has failed to meet the USPTO’s burden of proving a prima facie case of obviousness and, as a result, this rejection of claim 36 under 35 USC § 103(a) should be overturned and the claim allowed.

It is also submitted that there are other limitations recited in these rejected claims, in addition to those discussed above, that also distinguish the claimed invention patentably from the cited art and the other art of record. These additional distinguishing limitations were not discussed, because there is no need to do so at this time.

CONCLUSION

For the foregoing reasons, appellants respectfully submit that the Examiner has erred in rejecting this application. Please reverse the Examiner on all counts.

Respectfully submitted,

7/8/08  
Date

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CLAIMS APPENDIX

30. A multilayer mat comprising:

an intumescent layer having opposite outer edges, opposite ends, a first major surface and a second major surface opposite the first major surface, said intumescent layer having an area A1;

a first non-intumescent layer facing the first major surface of said intumescent layer, said first non-intumescent layer comprising inorganic fibers and said first non-intumescent layer having opposite outer edges, opposite ends, and an area A2 that is greater than area A1; and

a second non-intumescent layer facing the second major surface of said intumescent layer, said second non-intumescent layer comprising inorganic fibers and said second non-intumescent layer having opposite outer edges, opposite ends, and an area A3 that is greater than area A1,

wherein said intumescent layer is sandwiched between said first and second non-intumescent layers and positioned entirely within the area A2 of said first non-intumescent layer and the area A3 of said second non-intumescent layer, with at least one of the outer edges of said mat being free of intumescent material.

32. The multilayer mat of claim 30, wherein area A2 is substantially equal to area A3 and said first non-intumescent layer is aligned with said second non-intumescent layer.

33. The multilayer mat of claim 30, wherein said first non-intumescent layer has a length L2 and said second non-intumescent layer has a length substantially equal to length L2 and wherein said first non-intumescent layer has a width W2 and said second non-intumescent layer has a width substantially equal to width W2.

34. The multilayer mat of claim 30, wherein said first non-intumescent layer contacts said second non-intumescent layer along at least one edge of the mat.

35. The multilayer mat of claim 30, wherein said intumescent layer is divided into at least two segments that are separated from each other.

36. The multilayer mat of claim 30, wherein said intumescent layer has a thickness that is 5 to 25 percent of a total mat thickness.
37. The multilayer mat of claim 30, wherein said first non-intumescent layer has a first trough in a side facing said intumescent layer and said intumescent layer is positioned in the trough.
38. The multilayer mat of claim 37, wherein said second non-intumescent layer has second trough on a side facing said intumescent layer, the second trough is aligned with the first trough, and said intumescent layer is positioned in the first and the second trough.
39. The multilayer mat of claim 33, wherein said intumescent layer has a width W1 that is less than W2, said intumescent layer has a length L1 that is substantially equal to L2, and said second non-intumescent layer contacts said first non-intumescent layer along at least one edge of said multilayer mat.
40. The multilayer mat of claim 30, wherein said multilayer mat is free of intumescent material along at least one lateral outer edge of said multilayer mat.
41. A pollution control device comprising:  
an outer housing;  
a pollution control element; and  
a multilayer mounting mat according to claim 30 positioned between said pollution control element and said outer housing.
42. The pollution control device of claim 41, wherein said multilayer mat is free of intumescent material along at least one lateral outer edge of said multilayer mat.
44. The pollution control device of claim 41, wherein area A2 is substantially equal to area A3 and said first non-intumescent layer is aligned with said second non-intumescent layer.

45. The pollution control device of claim 41, wherein said first non-intumescent layer has a length L2 and said second non-intumescent layer has a length substantially equal to length L2 and wherein said first non-intumescent layer has a width W2 and said second non-intumescent layer has a width substantially equal to width W2.

46. The pollution control device of claim 41, wherein said first non-intumescent layer contacts said second non-intumescent layer along at least one edge of said mat, said at least one edge being positioned at a gas inlet side of said pollution control device.

47. The pollution control device of claim 41, wherein said intumescent layer is divided into at least two segments that are separated from each other.

48. The pollution control device of claim 47, wherein said pollution control element has an elliptical cross-section and the segments of said intumescent layer are positioned over portions of said pollution control element with a smaller radius of curvature.

49. The pollution control device of claim 45, wherein said intumescent layer has a length W1 that is less than W2, said intumescent layer has a length L1 that is substantially equal to L2, and said second non-intumescent layer contacts said first non-intumescent layer along at least one edge of said multilayer mat.

**EVIDENCE APPENDIX**

None.

**RELATED PROCEEDINGS APPENDIX**

None.